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# Work-based and Work-related Learning - Models and Learning Concepts

## Abstract

In Germany work-based learning – which goes by the long-established title: "Learning in the Process of Work", has been gaining in importance since the 1970s. The term learning here is considered the ideal for the comprehensive development that delivers professional competence. The digitalization of work actually reinforces a renaissance of learning in and through work. This is mirrored in new business and work concepts, such as the learning company and industry 4.0. Although in practice many varieties and models of work-related learning have been developed, the related research is still in its infancy. The variants are differentiated according to the place of learning in work-integrated, work-connected, and work-oriented learning. Of this typology, five models stand out in terms of the learning organization and didactic-methodological criteria. All relevant forms and concepts of work-related learning can be assigned to these models, from communities of practice through coaching to work-oriented learning at schools and universities. The theory of learning and didactic implementation takes place in learning concepts, which focus on action learning and the learner's self-regulation. These include concepts such as situated learning, self-directed learning and reflexive learning. Recognition and accreditation of learning outcome and success is a primary task: While experience-based learning phases in formally organized educational programs at schools and in universities are per se accredited, experience-based learning in the workplace for employees is recognized only in exceptional cases and accredited to formal educational programs in the vocational and academic educational sector.

**Keywords***: Work-based learning, work-related learning, work-oriented learning, learning concepts, experiential learning, work-connected learning, work-integrated learning*

## 1 Understanding and theoretical references

The terms work-based and work-related learning, refer to learning in enterprises, training centers, schools and academia. This includes direct learning at work and learning within work processes and through work. The main focus of this mode of learning is on the workplace and the work processes with their learning potentials and learning opportunities that must be analyzed and methodically developed. Therefore, in this section, we discuss the historical development of learning at work, followed by a discussion of the status quo of research on work-based learning in Germany. The general understanding of the concept of work-based learning is in line with the definition of the Interagency Group on Technical and Vocational Education (IAG-TVET, convened by UNESCO in 2008 "to ensure a good coordination of activities by the key international organisations involved in the delivery of policy advice, programmes and research on TVET" (IAG-TVET 2015)) whereas "Work-based learning

refers to all forms of learning that takes place in a real work environment. It provides individuals with the skills needed to successfully obtain and keep jobs and progress in their professional development. Apprenticeships, internships/traineeships and on-the-job training are the most common types of work-based learning. These types usually – but not always – combine elements of learning in the workplace with classroom-based learning."

### 1.1 Historic origin and classification

Learning in work is the oldest and most widespread form of professional qualification. It is a learning that incorporates idealistically cognitive, affective, and psychomotor dimensions equally. The place of work is simultaneously a place of learning. Experiences, motivation and social references are particularly addressed through the serious character of real work. The conditions and orientations of learning at work are highly dependent on historical, cultural and branch-specific circumstances. In Europe, the fields of craftsmanship and traditional teaching, business and job-specific work have been learned largely by imitation and on-the-spot imitation (Pätzold 2017). This is the case even today regarding the adaptation qualification and the rather unconscious learning in the work, which is the informal learning in sense of informal competence development. Learning is done in the workplace by watching, imitating, participating, helping and trying or simulating the observed person. The learning outcome essentially depends on supporting trained laborers or specialists at the workplace, on the work tasks, and the disposition and motivation of the learners.

From a pedagogic and educational perspective, learning at the workplace is first comes to light in the development of education in the eighteenth century and then systematically in the development of the industrial age (Stratmann & Schlösser 1990, Greinert 1999). In the context of learning in the area of craftsmanship, learning at the workplace is now seen under methodological aspects. Training workshops in industry and the start of the dual system are milestones in development. The 3rd Industrial Revolution - of information and communication technologies beginning in the 1970s – has meant that learning at the workplace has undergone fundamental change encompassing objectives, content, forms and methods of learning. New work and organizational concepts require self-directed, process-oriented and life-accompanying learning in the work, which contribute decisively to professional competence development (Streumer 2001, Frieling et al., 2007, Dehnbostel 2009).

"Learning in the Process of Work" *(Lernen im Prozess der Arbeit)* is mentioned early on in the German Democratic Republic both as a term and a concept (Zentralinstitut für Berufsbildung 1974). This specific kind of work-based learning already included school-based learning as "Teaching in the Context of Learning in the Process of Work" (ibid., 51 ff.). The intention was to implement the work place as a learning place in a structured manner and, in a centrally managed apprenticeship system of a nation-wide organized socialist production system, this was economically feasible.

Todays´ concepts of "learning in the process of work" are based on the change of work processes and work organization in industrial production (Senge 1990; Watkins & Marsick 1993) and the subsequent change of the laborers' role and the image of man. It is emphasized that work has an extended, holistic and cohesive structure demanding new skills making work-based learning possible and necessary in a previously unknown way. This learning is today characterized by subject-orientation, self-regulation, process-orientation, experiential learning and the combination of informal, non-formal and formal learning in increasingly digitalized work processes (Dehnbostel 2015, 30 ff.). This kind of learning is clearly expressed in new business concepts such as the learning company and in the implementation of the guiding principle of vocational or professional action competence. It is widely termed a renaissance of learning at the workplace.

### 1.2 Research approaches to work-based learning and "Learning in the Process of Work"

Thus far, there are few contributions to learning at the workplace of German VET research (Dehnbostel 2008, 445 ff., Schröder 2014, 5 ff.). At the present time, however, the research related to this is intensified by a primary focus on competency development, the combination of informal experiential learning with forms of education and validation, and the digitalization of the working world. Learning in traditional craftsmanship and in guild-related vocational education and training is reflected in the research approach to learning in communities of practice and in online communities (Henschel 2001, Müller 2002). The concept of Communities of Practice has its origin in ethnographically oriented studies (Lave & Wenger 1991, Wenger & Snyder 2000). Based on the learning concept of situated learning it is learning through actions and everyday activities in a community of practically active people. Learning and competence development take place in a common social space for all group members and are based on common rules and regulations.

Online communities represent a current development of communities of practice. Informal learning follows the principles of work-based learning. Due to the growing digitalization of the working world, it is expected that this virtual variant of communities of practice will continue to grow in their relevance for work and thus for companies. They represent the social grouping of people who share common interests and often shared living and working situations. In contrast to conventional school learning and teaching theories, it is assumed in communities, whether real or virtual, that learned knowledge and skills cannot be regarded separately from its genesis and its surrounding situations, which is constitutive for competence development. These underlying principles of informal learning were successfully tested and employed in virtual developments in which virtual work processes and theoretical input were productively combined and learners acquired relevant competences (Schröder 2014, Schröder 2015).

Communities of practice and online communities are new forms of work-related learning organization as coaching, learning bays, work- and learning tasks, and quality circle. These forms of leaning are characterized by combining systematic learning and working at the in-

company workplace. Research on learning at the workplace shows that these forms of learning contribute towards innovation of work processes (Molzberger et. al. 2008, Schröder 2009) and can be combined with systems of knowledge management (Schröder 2009a). Two further priority research areas, in which practical developments also advance the theory, are competency development and self-directed learning (Dehnbostel 2008, 446 ff.). For all three research subjects, experiential learning and reflexivity are the primary areas of analysis and knowledge. Already Dewey denoted reflexivity as a central category of thinking about experiences and individual development (1910/1951, 6).

In his basic approach to combine "experience and education", reflexivity is theoretically and practically interlinked with experiential learning. The experience derives from a preceding action. This experience is to be reflected and leads to knowledge, when actions are not repetitive, but holistic, containing problems and uncertainties, which is the rule in changing working processes and environments (Dehnbostel 2008, Schröder 2009). At present, digitalized work environments, which are dynamically driven by industry 4.0, represent such work environments and a subsequent change of work processes (Spöttl & Windelband 2017, Gennrich 2017). The sequence of action - experience - reflection and its continuation, taking into account previous experiences and knowledge processes, is a learning theoretical "evolutionary progress" assuming that learners learn actively and self-determinedly. On the basis of self-activity and self-determination, reality is developed individually through learning and experiential processes.

Donald Schön deepened Dewey's idea of learning from experience through reflexivity in his world-famous work "The reflective practitioner" (Schön 1983). According to Schön, reflexivity is a dialogue between thought and action, which enables the practitioner to cope with his complex tasks and its inherent problems. He distinguishes two modes of reflection for problem solving by professional action: the reflection in the action and the reflection on the action. The reflection in the action allows the practitioner to solve problems in which his tacit knowledge no longer helps him by reflection while the action is being performed. Reflection of this kind presupposes an awareness of one's own knowledge, but the practitioner must not necessarily be able to articulate his knowledge in a verbalized form. The result is a situationally coordinated action (ibid.9).

The second mode of reflection, the reflection on the action, is an abandonment or disembarkation from the action flow for the purpose of reflection on an action already performed or actions still to be performed. The reflexive consideration is made by cognitively capturing, storing and analyzing the action. To this end, the knowledge of action is formulated explicitly, it can be analyzed and reorganized. Engraving action problems due to inadequacies or mistakes in action knowledge can be remedied by changing the knowledge. Thus, knowledge becomes communicable and at the same time open to discussion and criticism.

This research and development approach of reflexive learning in the work is pursued by Argyris and Schön (1974) with the concept of organizational learning, in which the

reflexivity is applied to all employees and not only to professionals. Recent studies on reflexivity in work are strongly influenced by Scott Lash, who refers to his analysis of the theory of reflexive modernism, also called the second modernity (Lash et al., 1994). In Germany, the reflexivity is taken into strong consideration, especially regarding the concept of vocational action competence and the reflexive action competence (Dehnbostel 2015, 15 ff.; Dwi Fosa, Peinemann, & Schröder 2015).

## 2 Variants and models of work-based and work-related learning

As mentioned above, the term "work-related learning" is semantically broad and has many different meanings. Depending on its relation to in-company work, work-related learning can differ widely. Three variants of work-based and work-related learning can be distinguished from the criterion of the relationship between the place of learning and the place of work (Dehnbostel 2009, 2631 ff.):

- work-integrated learning: Learning venue and workplace are identical; the actual learning takes place at the workplace or in the work process. Examples are Communities of Practices (CoP), work- and learning tasks, traditional apprenticeship and adaptation training
- work-connected learning: Learning venue and workplace are separated, though spatially, and in terms of work organization, they are connected. In practice, e.g. there is learning area close to the production line, which focuses on education trainees relevant to a section of the production; the concept is dubbed the learning bay. Other examples are quality circles, learning stations, and internships
- work-oriented learning: Work-oriented learning take place in formal learning venues such as vocational schools or colleges, training centres or universities. Learning is made up here of simulation of work organization, work tasks and processes. It sets out to simulate real work places as exactly as possible. As learning rather than work is the primary aim, the disparity of simulated and real work places cannot be compensated.

When discussing aspects of learning organization and didactic-methodological criteria, five types of work-based learning can be distinguished and attributed to different organizational concepts of learning and organizational forms of learning. Individual concepts or shapes can be assigned to several models if they are designed differently. They feature in the graphic here and are described in more detail below:

| Models of work-related learning… | Work-related forms of learning organization |
|---|---|
| (1) …through active participation in real work activities<br><br>(work-integrated learning) | Learning on the job; communities of practice (colleagues); traditional apprenticeship; adaptation training |
| (2) …through companionship and instruction at work | Coaching; mentoring; learning facilitation; instruction; CoP (e.g. internet forum); initial skills |

| | |
|---|---|
| place<br><br>(work-integrated learning) | training; online communities |
| (3) …through combination of informal and formal learning<br><br>(work-integrated and work-connected learning) | Structured learning on the job; blended-learning; E-learning (e.g. virtual work and learning space); learning bay; quality circle; coaching; work- and Learning Task |
| (4) …through in-company observation and exploration<br><br>(work-connected and work-integrated learning) | R&D-based internship during program in higher education; in-company internship; pre-vocational program; benchmarking |
| (5) …through simulation of work organization, tasks, and processes in institutional setting<br><br>(work-oriented leaning) | Learn- and working tasks; learning fields; learning factory/office/bakery/restaurant/hotel etc.; project learning; E-learning |

Figure 1: Models of work-based and work-related learning (Dehnbostel 2007)

(1) **Learning through active participation in real work processes**

Learning through active participation in real work processes or "learning in the process of work" is the most common form of vocational education and training. It is a learning that idealistically incorporates cognitive, affective, and psychomotor dimensions equally. Experiences, motivation and social references are addressed in particular, through the actual seriousness of real work. In contrast to school and academic learning, the learning unfolds in real working and social situations. The conditions and orientations of learning at work are highly dependent on historical, cultural and branch-specific circumstances.

The concept of communities of practice (CoP) addressed in section 1.2 is a classical concept of learning through trade practices. In recent developments, the CoP and online communities as a virtual variant are accompanied in a targeted manner (Schröder 2017), so that they can also be assigned to the following model (2). Learning on the Job (Onstenk 1995) and various forms of adaptation training are further learning concepts for learning through active participation in the real work process.

**(2) Learning through companionship and instruction at work place**

In the company's educational work, systematic instruction mainly takes place in the initial training of unskilled and skilled laborer. Still the most simple form of training is based on the principle of imitation. In the course of dual apprenticeship, however, teaching does not correspond to the principles of modern methods of self-directed and self-determined learning, but it still has an important place in the plurality of learning methods. Masters, journeyman, and trainee specialists play a key role in traditional forms of instruction. They select the work

tasks, arrange the work and learning processes and evaluate the work results. The traditional instruction is often carried out according to the four-step method: preparing, showing, imitating and practicing (Greinert 1994). Companies increasingly employ this traditional practice in initial vocational training in advanced vocational training. However, these and similar learning methods at the workplace, such as analytical work instruction and the action-regulated instruction, contribute only to a limited extent to competence development and reflexive action competence as they are not holistic and self-controlled methods. Different forms of accompanied learning in the process of work, such as learning facilitation, coaching, and mentoring have resulted in new forms of accompanied learning have experienced a broad spread among companies in a short time (Dehnbostel 2015, 103 ff.). Also a part of this are accompanying communities of practice and online communities.

**(3) Learning through the combination of informal and formal learning**

Successful learning through the combination of informal and formal learning can be observed in new forms of learning organization such as learning bays, work and learning tasks and coaching. They have gained a great deal of importance in the field of in-company education, but are mainly practiced in large enterprises and, to a lesser extent, by medium-sized enterprises. For small businesses, work and learning tasks, learning and organization forms that combine formal and informal learning, have proven to be a success (Schröder 2009). Systematic learning processes in the immediate work process combined with informal and formal learning occur in the American "Structured Learning on the Job" approach (Jacobs 1999). In the 1980s, this structured learning process, rooted in traditional training methods, is supported by learning materials and equipment.

**(4) Learning through in-company observation and exploration**

In-company internships are assigned to work-connected learning. Work experiences, that occur in companies, are integrated into formal educational programs in schools, vocational schools, and universities. It organizational form differs as the example of Work Integrated Learnings (WIL) in university programs shows (Peach & Gamble 2011). The intention is for interns from schools to gain insight into the working world therefore acquiring real experience and a deeper understanding of theories. However, a targeted overview of areas not represented in one's own company is often sought for apprentices or trainees in decentralized inter-company programs. Under the auspices of formal inter-company associations and networks, systematic explorations and forms of job rotation are employed, which serve the acquisition of job-related or job-specific competences. Inter-company exploration is carried out when benchmarking is used as a form of learning organization. The comparison of methods, services and organizational processes plays a special role. These approaches and concepts are organized, formal learning measures, explicitly employing informal learning through experiences but not formalizing them.

**(5) Learning through simulating work organization, work tasks, and processes in an institutional setting**

Work-oriented learning in simulated workplaces and work processes takes place in schools, colleges, as well as in in-company, supra-company and non-company training and education centers. Well-known concepts and learning forms are production schools, training courses, training companies and task-based work in educational centers. Dual apprenticeship learners learn theory in vocational colleges in a task-based manner. The underlying curricula are based on so-called learning fields which reflect areas of the specific occupation. The well-known instructional psychology of "cognitive apprenticeship" also belongs to this model (Collins et al. 1989). This approach focuses on the transfer of basic elements of traditional trade apprenticeship to the acquisition of primarily cognitively determined competencies. While simulations do not allow for authentic learning, learning can be influenced to a great extent by realistic, work-related, spatial and economic criteria. Simulation of work processes sets out to create a learning situation that is as realistic as possible, to enable acquisition of complex competences and experiences and to have them reflected upon. Simulations in education and training are gaining in importance rather than losing despite the increase in learning at work is not a paradox, however, it is due mainly to the growing complexity of many work and service processes, and in particular to the observed growth potentials of simulated learning through digital media (Landriscina 2015).

The range of different models of work-based and work-related learning and the forms of learning organization associated with them will certainly continue, expand, and be differentiated in the future. To what extent learning in the workplace supplements or replaces conventionally organized learning outside of the workplace cannot be effectively estimated by today's stage of development and research. Nonetheless, it may be assumed that the acquisition of comprehensive, professional competence in vocational and academic education is only possible through the implementation of different models of work-related learning. Theoretically, didactically, methodologically and in terms of its learning-organization these models relate to each other in a reciprocal and complementary manner.

## 3 Learning concepts of work-based and work-related learning

The learning concepts for learning in and at work as well as for learning via work all aim at action-orientation and self-direction of the learner. They are shaped very differently when implementing methodic and didactic approaches. In work-integrated forms of learning such as learning on the job and communities of practice, a primarily informal learning takes place in the absence of didactically structured learning organization. Work-connected and work-oriented models are essentially related to formal learning and are intentionally structured by didactic-methodological methods. In the model mentioned in (3), informal and formal learning are combined, and the concepts and forms assigned to the model are didactically and methodically structured. Informal learning is very differently employed in these learning concepts. It is a learning through one’s own experiences and acquired in the operational context in and about work practices.

It results from work and action requirements and is not organized and accompanied by pedagogy, it is performed in an unintended manner. Informal learning ranges from conscious working and learning process through sensual and physical sensation to cognitively unconscious learning processes. According to relevant empirical studies, 60-80 per cent of an expert worker´s knowledge is based on informal learning (Dehnbostel et al., 2005). The extent to which informal learning is constitutive in work-based learning concepts depends on the extent to which learning is directly addressed in the work organization. Three important learning approaches are presented below (Dehnbostel 2015, 43 ff.).

### 3.1 Situated Learning

Situated Learning aims at action-learning in real work and life situations (Lave & Wenger 1991, Lave 1993). The situation and the social context characterize situated learning, which at the same time means that this learning is not functionally reduced, but is a form of acculturation, of growing into the learning and working culture. In contrast to relevant cognitivist learning concepts, the learning process is embedded in the respective conditions of original and surrounding situations, and cannot be separated from them. Not only knowledge and skills are passed on through this learning, but habits, attitudes and values. In a broad understanding, the concept of situated learning is the realization of a theory of social learning.

Situated learning is a process of continuous enculturation into a social group with its specific objectives, competences, internal structures and rules. The process of acculturation, becoming a full-fledged member, involves not only the acquisition of the relevant competencies dominated by the group, but also the acquisition of typical cultural practices and the formation of a group identity. As the following illustration illustrates, four reference categories are fundamental to this process.

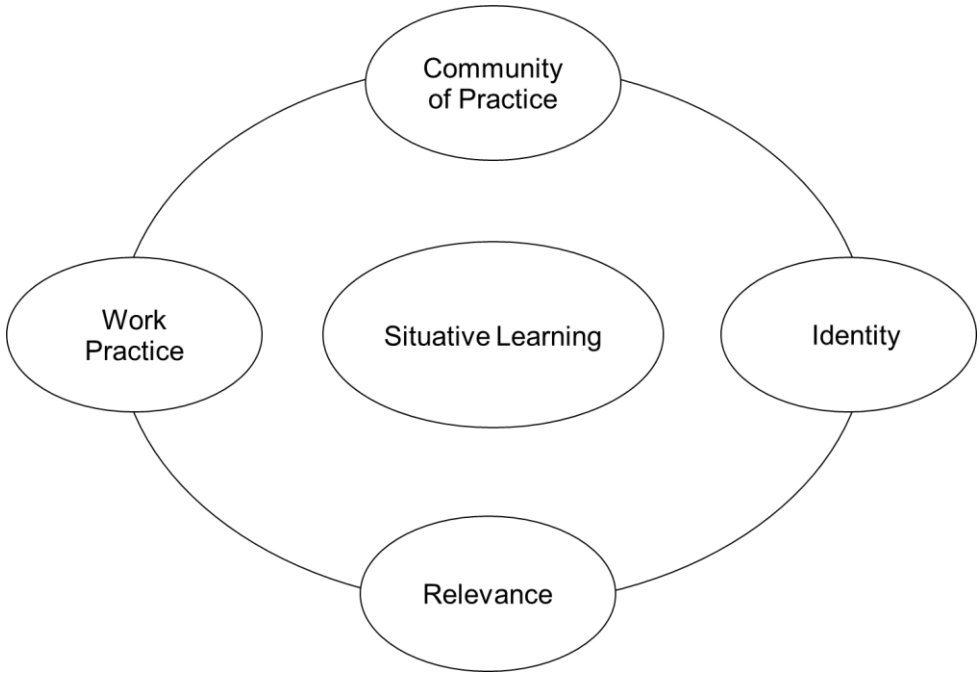


Figure 2: Reference categories of situated learning

**(1) Practice-Orientation**

Learning is practice-oriented. The learning process takes place through active action and practical experience in and with the community.

**(2) Group functions as a community of practice**

The group as a social community, whose individual and collective actions are directed toward a common goal, provides the framework for group learning and shapes the learning of the individual.

**(3) Formation of Identity**

The often protracted development towards an expert is accompanied by the formation of identity as a member of the respective in many social communities and group.

**(4) Meaning and importance of learning**

Newly acquired or generated knowledge and competencies are brought into harmony with one's own experiences and those of the other group members, while the learning process is taking place. The acquisition of knowledge and competency is meaningful, as learning takes place in an authentic practice context with transparent and clear objectives, not in a simulated situation, artificially designed solely for learning.

The concept of situational learning is based on the social context of a community of practice, a meaningful and sustainable practice, as well as the relevance of one's own actions. The affiliation to a group is socially and individually integrating and supportive. Learning and competence development take place in a common social space and embraces all members of the group.

This is especially the case for learning at the workplace: learning is done interactively with binding reference to work tasks and the respective subtasks of organization, planning and disposition. Attitudes and values are acquired in the group and within the work organization through socialization and mutual learning processes. Such an understanding of learning requires a different picture of learning than institutionalized formal learning. It is an experiential and informal learning that through integration into the social group and participation in their intentional actions eventually leads to learning outcomes and competences.

## 3.2 Self-directed Learning

Self-directed learning is the independent and self-determined control of learning processes. The learners determine the objectives and contents of the learning process in a certain framework, as well as the methods and tools for the regulation of learning, largely independently. However, the scope of the action or the superordinate structural classification of the relevant learning situation in work processes is predetermined under fixed criteria. With regard to the framework and the environment, self-directed learning is not autonomous

learning, but goal-oriented selection and determination of learning possibilities and learning paths.

This also addresses the crucial difference between self-directed and self-organized learning. In the case of self-organized learning, the institutional and organizational framework of learning is determined by the learner and is not determined from outside, as in self-directed learning. However, learning in work processes usually takes place in working situations, which are not specifically designed for learning. They are determined, however, by their objectives and higher organizational structures. At the same time, they enable independent and self-directed learning within the given framework, particularly reflexive learning based on experiences. Self-directed can refer to both an individual and a group.

Independent of learning theorems, the individual´s self-direction is a prerequisite for participatory and networked working forms in restructured work organizations. The design of newly acquired handling and disposition margins, the implementation of continuous improvement processes, the application of integrated quality assurance procedures as well as the fulfillment of target agreements are increasingly self-directed. Such self-directed processes are the consequence of decentralization and de-hierarchization in new work organizations. They are characteristic of modern work processes and at the same time inseparable from informal learning processes.

In this respect, the individual's self-direction in the work process and the resultant learning undoubtedly subordinate purposes and criteria, based on economic intentions, competitiveness and the corresponding forms of organization and qualification. Self-direction has become an important business factor in modern companies. From the individual´s perspective, there are self-directed action and learning orientations instead of instructional and hierarchical thinking, behavioral and orientation patterns. Processes and developments are made possible which take up real experiences and subjective interests more strongly and which correspond to a differentiation of educational paths and life patterns. To what extent these developments in the work can actually take place and be self-controlled does not exert itself primarily in an increased responsibility and the burden lies on the respective working conditions and working culture.

### 3.3 Reflexive Learning

Reflexive learning, as well as self-directed learning, embraces the changing learning and working conditions in modern work processes and the renaissance of learning at work. It is based on real work and action situations, and their consideration in work-related learning concepts has a historical forerunner, which focus on experience. In connection with constructivist learning approaches, it is crucial to view research based on the concepts of the reflexivity and experience by John Dewey and the "reflective practitioner" by Donald Schön (Dewey 1910/1951, Schön 1983).

Reflexive learning is a form of learning through understanding and conscious reflection of experiences. The underlying experiences are the result of sensory, emotional, social and cognitive perceptions. Intensive reflexive learning takes place in the work when the work processes are enriched by problems, challenges and uncertainties for the worker. The problems and its solutions are being reflected upon, which leads to the generation of knowledge. Lash (Lash et al., 1994) establishes a dual reflexivity: structural reflexivity and self-reflexivity.

Structural reflexivity aims to raise awareness of the rules and resources and the structures and social conditions of existence of the actors themselves. In self-reflexivity self-determination takes the place of the former heteronomous determination of the actors i.e. acting worker. Self-reflexivity, therefore, describes the capability of self-perception and the reflection of the actors over themselves. This ability to reflect and thus to detach from the surrounding structures is determined by the biography and the steps of formation and development contained in it, but influences this in turn in a retroactive process.

Self-determination and personality formation are inseparably connected with the ability to self-reflect and the recognition of social-enterprise processes. In actual work, reflexivity means, therefore, to reflect on work structures as well as about oneself, and connect with the preparation, execution and evaluation of work tasks. The tabular overview summarizes the dual reflexivity.

| Mode of reflexivity | Reflexivity in and about work |
|---|---|
| Structural reflexivity | Questioning and shaping work, working environments and work structures |
| Self-reflexivity | Reflection on your own competencies, shaping your own competence development |

Figure 3: Dual Reflexivity (Dehnbostel 2007)

In modern work processes, experiences are no longer made in the same way as in conventional work. The sensory feedback of work on the subject is changed, partly by the use of information and communication technologies. Above all, work experiences, which are mainly perceived through seeing, hearing and feeling are considerably limited of their things and services through automation, the employment of handling devices, diagnostic systems and the internet.

The digitalization of the working world continues at a rapid pace, which is emphasized through the concept of Industry 4.0. Reflexive learning does not refer to the reflexive processing of sensory experiences, but to an extension of the external experiences beyond the conventional sense through mental, cognitive, emotional and interactive digital processes. The digital working world connects the physical to the virtual working world and requires reflexive learning, especially in this phase of technological transition. The reflexive processing of increasingly digitalized experiences and thus reflexive learning itself seem equally relevant for all variants and models of work-related and work-based learning.

## 4 Outlook: Accreditation of prior Learning Experiences and Validation of Informal Learning

Work-related and work-based learning, which is informal learning in the workplace, is acknowledged in the field of company personnel development, but accreditation to professional or academic education courses have thus far only been given in exceptional cases. This is contrary to work-based learning phases conducted by schools and universities, whether through an internship or in a dual course of studies, it is considered as part of the respective educational program.

A wide range of systems and procedures have been developed at the European level to validate the competencies acquired through learning at work (CEDEFOP 2015). A sufficient and also scientifically recognized and proven systematization of the competence assessment and validation methods developed so far in theory and practice has not yet been available. The polar criteria of work requirement and educational development are suitable as helpful categories for such a systematization. Following that, procedures in which the individual and his personality development are given priority are distinguished from procedures that analyze competencies from the perspective of work requirement. The classification between economically determined work and the qualifications derived from it on the one hand and the subject-based competency development on the other, form the basis for the assessment of competence analysis methods in the spectrum of different interests. In any case, "Learning the Process of Work" plays a central role in the development of the individual's competence. Through their validation and accreditation, they are linked to the overall education system. The employment and education system will be more permeable through an enhanced integration of vocational and academic education.

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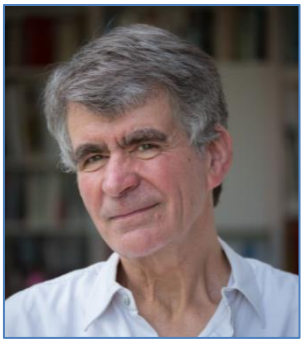

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